

CLAIMS

What is claimed is:

1. A transducer assembly comprising:
 - a housing having an acoustic seal;
 - a transducer for coupling acoustic energy between an outside of the housing and an inside of the housing; and
 - a hybrid circuit partially enclosed within the housing, the hybrid circuit comprising:
 - a first input circuit for coupling a signal from the transducer;
 - a filter network coupled to the first input circuit;
 - an output circuit coupled to the filter network;
 - a tuner for adjusting the filter network; and
 - a controller for altering a value of the tuner, the controller having a second input on a portion of the hybrid circuit external to the housing, whereby a tuning signal coupled to the second input is used to adjust the tuner, thereby changing a characteristic of the filter network.
2. The transducer assembly of claim 1 wherein the controller retains a setting upon receiving the tuning signal.
3. The transducer assembly of claim 1 wherein the portion of the hybrid circuit external to the housing is permanently removed after the controller receives the tuning signal.
4. The transducer assembly of claim 1 wherein the tuner is a ladder network, the ladder network adjustable by activating or deactivating a semiconductor device between an element of the ladder network and a signal ground connection.
5. The transducer assembly of claim 4 wherein the ladder network comprises resistors.
6. The transducer assembly of claim 5 wherein the resistors have a nominal value of 5.5k ohms.

7. The transducer assembly of claim 4 wherein the ladder network comprises capacitors.

8. The transducer assembly of claim 4 wherein the semiconductor device is a field effect transistor (FET).

9. The transducer assembly of claim 1 wherein the second input is coupled to a biasing element, the biasing element maintaining a state after receiving the tuning signal.

10. The transducer assembly of claim 1 wherein the transducer is a microphone.

11. A method for adjusting an acoustically sealed transducer assembly having a buffer circuit comprising:

assembling the buffer circuit in an acoustically sealed housing, a portion of the buffer circuit accessible from outside the housing;

providing a desired response characteristic for the buffer circuit;

measuring an initial response characteristic of the buffer circuit;

comparing the desired response characteristic to the initial response characteristic;

determining an adjustment using the comparison, the adjustment for reducing a difference between the desired and initial response characteristics;

transmitting a signal to a selector circuit in the buffer circuit; and

tuning an adjustable filter coupled to the selector circuit, the adjustable filter for modifying the initial response characteristic.

12. The method of claim 11 further comprising:

removing the portion of the buffer circuit accessible from outside the housing, the portion used in transmitting the signal to the selector circuit.

13. The method of claim 12 wherein removing the portion of the buffer circuit further comprises removing the portion of the buffer circuit along one of a scoring and a line of weakness on a substrate carrying the buffer circuit.

14. The method of claim 11 wherein the tuning the adjustable filter further comprises activating a semiconductor device between an element of a ladder network and a ground connection.

15. The method of claim 11 wherein the tuning the adjustable filter further comprises biasing the selector circuit with a biasing component.
16. The method of claim 15 wherein the biasing component is a zener-zap diode.
17. The method of claim 15 wherein the biasing component is an electrically erasable programmable read-only memory (EEPROM).
18. The method of claim 15 wherein the biasing component is a polysilicon fuse.
19. The method of claim 15 wherein the biasing component is a laser trimmable hybrid resistor.
20. A transducer assembly having a transfer function of an acoustic energy to electrical energy comprising:
 - a housing comprising:
 - a first molded piece having an acoustic port;
 - a second molded piece coupled to the first molded piece;
 - a substrate having a first portion inside the housing and a second portion extending outside the housing; and
 - a circuit disposed on the substrate for receiving a signal corresponding to acoustic energy received at the acoustic port,whereby the transfer function of the miniature transducer assembly can be altered by a signal injected at the second portion of the substrate.
21. The transducer assembly of claim 20 wherein the second portion of the substrate is removably attached to the first portion.
22. The transducer assembly of claim 20 wherein the circuit comprises a component for receiving the signal, the component operable to retain a programmed state after receiving the signal.
23. The transducer assembly of claim 22 wherein the component is coupled to one of a resistor ladder network and a decoder.

24. The transducer assembly of claim 20 wherein the component is one of a zener-diode, an electrically erasable programmable read only memory (EEPROM), a polysilicon fuse and a laser trimmable hybrid resistor.